

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated September 25, 2003 (U.S. Patent Office Paper No. 5). In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 1, 3, 4, 7, 16, and 17 are being amended to correct formal errors and to more particularly point out and distinctly claim the subject invention.

Additional Amendments

The drawings are being amended to correct formal errors and to better disclose and describe the features of the present invention as claimed. Fig. 6 is being amended by adding the legend "Prior Art".

In response to the first objection to the drawings formulated by the Examiner on page 2 of the Office Action, paragraph 2, Applicants respectfully submit that the objected feature "said substrate has a convex portion" was recited by claim 7. Applicants respectfully submit that claim 7 is being amended to recite "protrusive portion" instead of "convex portion". Protrusive portion 197 is disclosed in Figs. 8, 9, 10, 11B, 12, 13B, 14A, 14B, 15B, and 16B. Further, the feature "protrusive portion" is described on page 15, lines 15 to 17 that discloses that the first embodiment of the present invention is shown in Fig. 8. Specifically, a protrusive portion 197 is provided in the substrate 300 that contacts the electronic refrigeration device 401, an upper portion of the protrusive portion is disposed as near as possible to a portion 199 of the wavelength selection device 108 (e.g., etalon), through which portion the transmitted light-beams pass.

In response to the second objection to the drawings formulated by the Examiner on page 2 of the Office Action, paragraph 3, Applicants respectfully submit that claim 17 recites "said etalon is divided into a first etalon and a second etalon". Applicants have amended claim 17 to cancel the objected feature and to replace the feature with "an optical path has a first optical path and a second optical path in said etalon". The recitation of claim 17 claims embodiment 8 of the present invention, further illustrated by Figs. 15A and 15B. In the

specification, page 20, lines 16 and 17, describe that “through which etalon the respective light-beams of different optical path length pass”.

Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Formal Objections or Rejections

Claim 4 was objected to due to a typographical error. Applicants respectfully submit that claim 4 has been amended to replace “3im” with “3 μ m”.

Claims 1 to 24 were rejected under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement. In particular, claims 1 to 16 recite a formula to obtain the height that the Examiner deems to have no support in the written description.

Applicants respectfully submit that claims 1, 3, and 16 have been amended to cure the above referenced informality.

Prior Art Rejections

Claims 1 to 7 and 11 to 15 were rejected under 35 U.S.C. §102(e) as being anticipated by Komiyama *et al.*, U.S. Patent No. 6,477,190 (further, the ‘190 reference).

Amended claim 1 recites an optical module, wherein it is arranged such that one part of light-beams emitted from a laser luminous source is transmitted as a first optical beam through an etalon so as to be introduced into a first optical detection means while at least the other part of said light-beams is introduced into a second optical detection means without being transmitted through the etalon. The difference between said first and second optical beams is defined as a wavelength error signal, on the basis of the signal an oscillating frequency of the laser luminous source is maintained at a given value. The laser luminous source and etalon are disposed on a substrate. By way of the substrate, a temperature control means for controlling a temperature of the etalon and the laser luminous source, respectively, within a given range is provided. The shortest distance h from a fixed end of the etalon on the substrate to an optical axis of said first luminous flux transmitting through said etalon ranges from one-tenth fold through four fold of the light-beam’s radius a.

Among the features of the present invention, the upper portion of a protrusive portion is disposed as near as possible to a portion 199 of the wavelength selection device 108, the etalon, through which the portion 199 of the light beam passes. The substrate with the

protrusive portion 197 is in contact with the electric refrigeration device 401. As recited in claim 1, "one part of the light-beams emitted from a laser luminous source is transmitted as a first optical beam through an etalon so as to be introduced into a fist optical detection means." The temperature dependency of the etalon is thus abated. Therefore, it is necessary that the light-beam transmits through the lower portion of the etalon, closer to the substrate and precisely, through the upper portion of the protrusive portion 197. The substrate is in contact with the electric refrigeration device in order to abate the temperature dependency of the etalon. In the upper portion of the etalon, the temperature dependency range is larger than in the lower portion of the etalon, due to the fact that the upper portion is farther from the substrate contacting the electric refrigeration device.

The Examiner alleges in the office action, page 4, that the disclosure of Figs. 11, 13, 22, 23, and 24 of the '190 reference anticipates the recitation of claims 1 through 7 and 11 to 15. Applicants respectfully disagree and submit that they have carefully reviewed the '190 reference but could not find in the patent disclosure, teaching or suggestion about the feature of claim 1 "one part of the light-beams emitted from a laser luminous source is transmitted as a first optical beam through an etalon so as to be introduced into a fist optical detection means" wherein "by way of the substrate a temperature control means for controlling a temperature of the etalon and the laser luminous source, respectively within a given range is provided". The '190 reference merely discloses a temperature control means 53 that controls the temperature of a thermoelectric element and of a laser diode. The temperature control means recited by claim 1 control the temperature of the "etalon and the laser luminous source".

Based on the differences outlined above the Applicants respectfully submit that the '190 reference does not identically disclose, teach or suggest all the features of claim 1 as recites. Therefore, Applicants respectfully ask the Examiner to withdraw the rejection regarding claim 1.

Claims 2 to 7 and 11 to 15 depend from and add features to allowable claim 1. Therefore, they are also allowable at least due to the reasons discussed above in connection with claim 1.

Claims 16 to 21 were rejected under 35 U.S.C. §102(b) as being anticipated by Villeneuve *et al.*, U.S. Patent No. 5,825,792 (further, the '792 reference). Applicants respectfully disagree.

Amended claim 16 recites an optical module, wherein it is arranged such that one part of light-beams emitted from a laser luminous source is transmitted as a first luminous flux through an etalon so as to be introduced into a first optical detection means while at least the other part of said light-beams is transmitted through the etalon so as to be introduced into a second optical detection means and that there is a difference within the etalon between an optical path length of the first luminous flux and the length of the second luminous flux. The difference between said first and second fluxes is defined as a wavelength error signal. On the basis of the signal, an oscillating frequency of the laser luminous source is maintained at a given value, wherein said laser luminous source and etalon are disposed on a substrate. By way of the substrate, a temperature control means for controlling a temperature of the etalon and the laser luminous source, respectively, within a given range is provided, wherein the shortest distance h from a fixed end of the etalon on the substrate to an optical axis of said first luminous flux transmitting through said etalon ranges from one-tenth f old through four fold light-beam's radius a . The lower end of said etalon is fixed within the range $a/10 < h < 4a$ and $a/20 < h < 2a$.

The Examiner alleged in the office action, on page 5 that the disclosure of Figs. 4 and 5 of the '792 reference anticipates the recitation of claims 16 through 21. Applicants respectfully disagree and submit that the feature in claim 16 of "the lower end of said etalon is fixed within the range $a/10 < h < 4a$ and $a/20 < h < 2a$ " is not disclosed, taught or suggested in the '792 reference. Further, the feature in claim 16 of "the difference between said first and second fluxes is defined as a wavelength error signal, on the basis of the signal an oscillating frequency of the laser luminous source is maintained at a given value" is also not disclosed, taught or suggested. Based on the above, Applicants respectfully submit that the '792 reference does not identically disclose, teach or suggest each and every feature of the present invention as recited in claim 16. Therefore, the '792 reference cannot anticipate the recitation of claim 16, and Applicants respectfully ask the Examiner to withdraw its rejection regarding claim 16.

Claims 17 through 21 depend from and add features to allowable claim 16. Therefore, they are also allowable at least due to the reasons discussed above in connection with claim 16.

Claims 1, and 8 to 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Komiyama *et al.*, U.S. Patent No. 6,477,190 (further, the '190 reference) in view of May, U.S. Application No. 2002/0163650 (further, the '650 application).

Claims 16, 22 to 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Villneuve *et al.*, U.S. Patent No. 5,825,792 (further, the '792 reference) in view of May, U.S. Patent Application No. 2002/0163650 (further, the '650 application).

In response to the above rejections, Applicants respectfully submit that the '650 application does not constitute a proper secondary reference against the present invention. The '650 application was filed January 31, 2001 and was not available to the public until its publication on November 7, 2002. The '650 application is a continuation in part of application No. 09/65,212 filed on October 10, 2000. The '212 application matured into U.S. Patent No. 6,587,484 issued on July 1, 2003. The '212 application was not made available to the public by publication till issue date, June 1, 2003. Therefore, neither the '650 application nor its parent application were available to the public on June 21, 2001 or after the priority date of the present invention. Therefore, neither document can constitute prior art against the above referenced claims.

Even if the '650 application could be considered prior art, Applicants will submit that it is only a secondary reference that is only cited for a very specific feature, and does not by itself show all the features of the present invention as claimed. Even more, as pointed out above, the primary reference (the '190 reference) already falls short of showing every feature of the claimed invention. The '650 application fails to make up for those deficiencies, namely, the lack of "one part of the light-beams emitted from a laser luminous source is transmitted as a first optical beam through an etalon so as to be introduced into a fist optical detection means" wherein "by way of the substrate a temperature control means for controlling a temperature of the etalon and the laser luminous source, respectively within a given range is provided".

Applicants respectfully ask the Examiner to withdraw the rejections to claims 1, 8-10, 16, and 22 – 24 and to pass these claims to issue.

Conclusion

In view of all the above, Applicants respectfully submit that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

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